The Off-Hours Delivery Project in New York City

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The USDOT/RITA Project on Off-Hour Deliveries (OHD)
The project has been, at times...

- A science mystery
- A political thriller
- A melodrama
- A comedy
- A Greek tragedy
- A good drama with a happy ending...
Background
Milestones

- **2002**: The Council of Logistics Management asked New York State Department of Transportation (NYSDOT) to study how to foster OHD in NYC.
- **2003-2006**: NYSDOT funded an OHD project focused on Manhattan; Brooklyn private sector groups asked for a study, and the project was expanded.
- **2007-current**: USDOT’s Commercial Remote Sensing and Spatial Technology program funded two projects with a pilot, and a design/implementation phase.

“Off-Hour Deliveries” are those taking place between 10PM and 6AM.
Why do We Need to Intervene to Foster OHD?

- Markets find efficient outcomes, if they do not, there is a market failure → public sector intervention
- The market failure is the result of the unwillingness of receivers to accept OHD
- Increasing off-hour deliveries is beneficial to Society
- The solution is to either:
  - Compensate the receivers for additional costs, or
  - Develop technologies/systems to allow receivers to do OHD at lower costs (so that compensation could work)
1st Phase: Research and Pilot Testing
Research Conducted

- Behavioral/economic
  - Analyses of most promising industry segments
  - Incentives to receivers of cargo willing to do OHD
- Technology: GPS to assess performance
- Network models were used to assess local and network wide impacts
- Industry/Agency outreach and engagement
- Pilot test to assess real life impacts...delayed by:
  - Skepticism on the part of the industry
  - The huge challenge of not having any precedents

and...
The Wall Street Collapse

JP Morgan Pays $2 a Share for Bear Stearns

By ANDREW ROSS SORKIN
Published: March 17, 2008

In a shocking deal reached on Sunday to avoid what traders called a "Lehman Brothers-style" collapse, JPMorgan Chase agreed to pay a mere $2 a share — less than one-tenth the firm's market value — for Bear Stearns.

As part of the deal, JPMorgan will guarantee Bear Stearns' $30 billion obligation to hedge funds, a transaction that was driven by what a fund manager describes as a "panic run" on the bank.

Reflecting the market's view of Bear's prospects, the stock fell another 30% Monday, after plunging 74% on Sunday. The stock closed at $1.27. Although the stock is also trading below $1, the company announced that it would pay shareholders $2 a share, or $5 billion, to keep the bank afloat.

Feds Probe IndyMac, Expand Subprime Inquiry

By JASON RYAN (@jasonRyanABC) and THERESA COOK
July 16, 2008

Lehman Files for Bankruptcy; Merrill Is Sold

By ANDREW ROSS SORKIN
Published: September 14, 2008

This article was reported by Jenny Anderson, Eric Dash and Andrew Ross Sorkin and was written by Mr. Sorkin.

In one of the most dramatic days in financial history, Lehman Brothers announced that it was filing for bankruptcy protection, and Merrill Lynch was sold to Bank of America.

Largest one-day points drop ever

From NBC's Domenico Montanaro

The Dow finished down 777.68 points, or almost 7%. It is the largest one-day drop in points in the history of Wall St. In 1987, on Black Monday, the market dropped 20%.

Video: CNBC's Michelle Caruso-Cabrera discusses the DOW's freefall following the collapse of the Wall Street bailout and what effects it will have on world markets. 'There's no credit available.... It stops business in its tracks,' says Cabrera.
1st Phase: Pilot test

- Three separate one-month stages:
  - Foot Locker (ten stores)
  - Whole Foods (four stores)
  - Sysco (twenty one stores)

- About 35 receivers, 20 trucks/vendors:
  - Half doing staffed OHD
  - Half doing unassisted OHD
Regular vs. Off-Hour Deliveries
Regular vs. Off-Hour Deliveries
Results From Satisfaction Surveys

- Carriers/Vendors: 1.55

- Drivers:
  - Travel speeds = 1.33
  - Parking = 1.11
  - Time to deliver = 1.38
  - Time to complete the route = 1.44
  - Congestion = 1.11
  - Stress levels = 1.11
  - Feeling of safety = 1.86

- Receivers:
  - Impression of off-hour deliveries = 1.50
  - How likely are you to off-hour deliveries = 1.42
  - If all liability issues were addressed, would you be interested in receiving unassisted OHD? = 2.17

Scale: 1= Very favorable, 5= Very unfavorable
Average Space Mean Speeds

More than twice as fast
More than three times as fast
After the End of the Pilot

- All of the receivers doing staffed OHD reverted back to the regular hours
- Almost all the receivers doing unassisted OHD remained in the off-hours
  - The reason: reliability of OHD
  - “Our locations will continue to receive ‘night drops’ even though this program has ended as our managers now favor the dependability of night drops vs. late day time deliveries. Thanks again for the program.”
  - Nick Kenner, Managing Partner, Just Salad LLC

**Key lesson:** Unassisted OHD work for large numbers of receivers, and do not require on-going incentives
2nd Phase: Design and Launch
Unassisted Off-Hour Deliveries

- Main focus of the 2nd phase of the OHD project
  - Unassisted OHD:
    - Only a one-time-incentive is needed
    - Once they try it and like it, receivers stay in the off-hours
  - Large Traffic Generators (large buildings/establishments)

- Research was conducted to find out how to:
  - Foster:
    - Unassisted OHD at businesses establishments (retail and the food sector are the top priority)
    - OHD at Large Traffic Generators
  - Use technology to:
    - Reduce noise during OHD
    - Facilitate Unassisted OHD
Unassisted OHD: Behavioral Research

Key determinants in OHD participation:
- One-Time-Incentive (financial)
- Discounts from vendors (financial)
- Business support is worth → US$1,000 - $3,000
- Public recognition is worth → US$600 - $1,100
- Trusted vendor is worth → US$24,000 - $36,000

Suggestion:
- Public sector → Incentives and public recognition
- Carriers/vendors → Shipping discounts
- Trucking groups → Create a “Trusted vendor” program

Re-align federal/state incentive programs:
- Environmental, economic, etc. to support OHD
- Require recipients to accept OHD
2nd Phases: Launch

Key participants:

- Sysco: 31 OHD routes/week (18% of their routes, 171) delivering to 140 unassisted off-hour delivery customers
- Wakefern: 5 OHD routes/day (25% of their total)
- Duane Reade: Approximately 120 of their 160 Manhattan stores receive OHD on a regular basis
- Dunkin Donuts: 72 stores out of 121 in Manhattan
- Beverage Works (Red Bull) has approximately 130 routes in the NY Metro, 22% are OHD
- Waldorf Astoria
The Economic Bottom Line
Economic Impacts

- Implementing various forms of off-hour delivery policies in Manhattan leads to:
  - Travel time savings to all highway users of about 3-5 minutes per trip
  - Travel time savings to carriers that switch to the off-hours of about 48 minutes per delivery tour
  - Savings in service times (per tour) could be up to 1-3 hours
- Depending on the extent of the implementation, economic savings are between $100 and $200 million/year in travel time savings and pollution reductions
Environmental Pollution Reductions

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<tr>
<th>TOTAL/YEAR</th>
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<tbody>
<tr>
<td>Scenario</td>
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<tr>
<td>% OHD</td>
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<tr>
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<tr>
<td>14.10%</td>
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<tr>
<td>20.90%</td>
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<td>29.07%</td>
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<table>
<thead>
<tr>
<th>PER RECEIVER/YEAR</th>
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## Average CO₂ Emission Rates

- Estimated using truck GPS data and the Comprehensive Modal Emission Model

<table>
<thead>
<tr>
<th>Road type</th>
<th>Segment</th>
<th>Off-hours</th>
<th>Regular hours</th>
<th>Difference</th>
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<td>Manhattan (grams/mile)</td>
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<td>#3</td>
<td>2160.5</td>
<td>8458.7</td>
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There is Public Support...as Reflected by Media

TIME magazine listed the OHD project as a “Top 10 Ideas” March 25th, 2013.
Policy Impacts
Milestones

- **2011**: NYC added OHD to its sustainability plan (plaNYC)
- **2012** Federal Highway Administration/Environmental Protection Agency announced a OHD program
- **2013** NYSERDA/NYCDOT funded a project to incentivize receivers to accept OHD
- Numerous cities have inquired about OHD programs
Lessons Learned
Key Lessons

1. Behavior Changes are Needed
2. Stakeholder Collaboration is Needed
3. Receivers are the Key
4. Incentives are Needed
5. Ensure High Level Support
In Conclusion

- Engaging receivers is the winning strategy
- OHD is a win-win-win-win-win-win policy:
  - Benefits regular hours travelers
  - Benefits the environment, improves quality of life
  - Benefits the business community, enhances economy
  - Noise impacts could be easily mitigated → electric trucks, low-noise truck technologies/practices
- A win-win-win-win-win-win policy is politically appealing, implementable as a voluntary program
- In our opinion, this is the way to go...
Acknowledgments

- Funding Agencies:
  - USDOT/RITA’s Commercial Remote Sensing and Spatial Information Technology Application Program, and Mr. Caesar Singh
  - New York City Department of Transportation, and particularly, Commissioner Janette Sadik-Kahn
  - NY State Department of Transportation (NYSDOT)
  - NY State Energy Research and Development Agency
- Private sector partners
- Project partners and team members
Thanks! Questions?

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